Integration of Prescription Drug Monitoring Programs (PDMP) in Pharmacy Practice: Improving Clinical Decision-Making and Supporting a Pharmacist's Professional Judgment

2016

Connor W. Norwood, M.H.A., Eric R. Wright, Ph.D.

Article Synopsis:

Enforcement action against pharmacists is most prevalent when pharmacists fail to exercise corresponding responsibility. This cross-sectional study examined the relationship between pharmacists' use of Indiana's PDMP and dispensing practices of controlled substance prescriptions (CSP). Changes in dispensing, to dispense fewer CSPs, were attributed to PDMPs increasing access to patient drug histories by 53% of pharmacists. The study found that PDMP users were more likely to report refusing to dispense a CSP. Consistent use of PDMPs in pharmacy practice leads to more refusals of CSPs. Increased access to patient information facilitates pharmacists' ability to detect prescription drug abuse and diversion.

This is the authors' manuscript of the work published in its final form as:

Norwood, C. W., & Wright, E. R. (2016). Integration of prescription drug monitoring programs (PDMP) in pharmacy practice: Improving clinical decision-making and supporting a pharmacist's professional judgment. Research in Social and Administrative Pharmacy, 12(2), 257–266. https://doi.org/10.1016/j.sapharm.2015.05.008

ABSTRACT

BACKGROUND: Pharmacists have shared responsibility to investigate the validity of controlled substance prescriptions (CSPs) that raise red flags and subsequently exercise their right to refuse to dispense a CSP if its validity cannot be verified. Improving access to clinical practice tools, such as prescription drug monitoring programs (PDMPs), may increase availability of a patient's drug history, which is critical to making informed clinical decisions about dispensing CSPs.

OBJECTIVES: The purpose of this study was to examine how integration and consistent use of a PDMP in pharmacy practice impacts pharmacists' dispensing practices related to CSPs.

METHODS: A cross-sectional study examined pharmacists' knowledge and use of Indiana's PDMP (INSPECT) and dispensing practices of CSPs. Three outcome measures were analyzed using multiple logistic regression in order to examine the relationship between PDMP use and pharmacists' controlled substance dispensing behaviors.

RESULTS: Pharmacists were 6.4 times more likely to change their dispensing practice to dispense fewer CSPs if they reported INSPECT provided increased access to patient information. Pharmacists who always use INSPECT refused an average of 25 CSPs annually compared to an average of 7 refusals for pharmacists not using INSPECT. Pharmacists using INSEPCT consistently (at every visit) were 3.3 times more likely to refuse to dispense more CSPs than pharmacists who report never using INSPECT.

CONCLUSION: Integration of PDMPs in pharmacy practice may improve a pharmacist's ability to make informed clinical decisions and exercise sound professional judgment. Providing clinical practice tools to both prescribers and pharmacists is important to preventing drug diversion and prescription drug abuse in the United States. Future research should focus on

understanding the barriers and challenges to successful integration of PDMPs in pharmacy practice.

INTRODUCTION

In 2015, the Center for Disease Control and Prevention (CDC) reported that drug deaths related to prescription opioids have remained stable since 2012. This may suggest that the United States is gaining some ground in regards to fighting the epidemic of nonmedical use of prescription drugs. However, there remains a significant amount of work to be done to improve the prevention and treatment of substance abuse.[1] In 2007, the CDC reported that every 19 minutes someone dies from an unintentional prescription drug overdose in the United States, which resulted in 27,000 deaths in 2007 alone.[2] If the number of deaths related to prescription drug abuse is not alarming enough, the CDC reports that for every unintentional overdose, "9 persons are admitted for substance abuse treatment, 35 visit emergency departments, 161 report drug abuse or dependence, and 461 report nonmedical uses of opioid analgesics".[2] Prescription drug abuse is by no means a new problem in the United States. However, the continued growth and the current scale of the problem has reason to raise serious concern.[3] The distribution of opioid drugs has increased by over 7 times between 1997 and 2007.[2] Unfortunately, with this increase in distribution of opioid drugs comes an increased risk of drug diversion. Drug diversion occurs when prescription drugs are used for recreational purposes, and thus are "diverted" from their original purpose.[4, 5] Although, drug diversion can occur at various stages of the prescribing and dispensing process, the pharmacist may be the "last line of defense".[4, 5]

Federal regulation 21 C.F.R. § 1306 requires that prescriptions for controlled substances be issued for legitimate medical purposes by individual practitioners acting in the usual course of their professional practice.[4, 5] That same law imposes responsibility on pharmacists who fill the

prescriptions. If pharmacists knowingly fill improper or invalid prescriptions, they, as well as the prescribers, can be held accountable.[5, 6] Similarly, state law requires pharmacists performing their duties to exercise professional judgment that is in the best interest of their patients' health. Before honoring prescriptions, pharmacists are required to take reasonable steps to determine whether a prescription has been issued in compliance with state law.[4] According to federal regulation 21 C.F.R. § 1306, a pharmacist may refuse to fill a prescription if professional judgment suggests filling it would be contrary to law, be against the best interest of the patient, aid or abet an addiction or habit, or be contrary to the health and safety of the patient.[4] Unfortunately, making a clinical decision to refuse to dispense a controlled substance may prove difficult for many pharmacists due to a variety of factors that block or inhibit their ability to make an evidence-based clinical decision such as lack of patient information or lack of evidence-based resources.[7]

In recent decades, Prescription Drug Monitoring Programs (PDMPs) have become more prominent across the United States. A PDMP is a statewide electronic database that collects detailed data on controlled substance prescriptions (CSPs) in a state. [8, 9] As of 2013, 49 states had enacted legislation to develop PDMPs, and 48 states have implemented these programs.[8] PDMPs can help identify major sources of prescription drug diversion such as prescription fraud, forgeries, doctor shopping and improper prescribing and dispensing practices.[10] PDMPs have proven to be invaluable tools in fighting the growing prescription drug abuse epidemic in the United States by reducing drug diversion of controlled substances and improving clinical decision-making through increased access to detailed patient drug histories for both prescribers and dispensers.[10]

In 2004, the State of Indiana expanded previous legislation and secured grant funding to establish the Indiana Scheduled Prescription Electronic Collection and Tracking Program (INSPECT), Indiana's PDMP, in order to provide an additional clinical resource to ultimately improve providers' clinical-decisions by expanding access to their patients prescription drug histories. An INSPECT report summarizes all CSPs a patient has been prescribed and includes information regarding the practitioner(s) who prescribed the controlled substance as well as the pharmacy and pharmacist who dispensed the CSP.[11] Although, a growing body of evidence suggests that incorporation of PDMPs are effective in increasing clinical-decision making by providing greater access to patient drug information, nearly 30% of providers in Indiana report not using INSPECT, according to a 2012 study conducted by the Indiana University Center for Health Policy (CHP).[10, 12] While Indiana pharmacists were significantly more likely to have heard of INSPECT they, unfortunately, were not more likely to have reported using the program in their pharmacy practice.[12]

Pharmacists may be considered the "gatekeepers" of the controlled substances that have had such an impact on the prescription drug abuse epidemic in the U.S. As the "last line of defense," pharmacists are challenged with ensuring that patients being treated for legitimate chronic pain have access to their CSPs, while identifying CSPs that have not been prescribed for a valid medical purpose.[8] Furthermore, pharmacists have the responsibility to investigate the validity of CSPs that raise red flags, resolve these red flags, and ultimately exercise their right to refuse to dispense a CSP if the validity of the prescription cannot be verified.

PDMPs are valuable clinical resources that provide pharmacists with additional information regarding their patients. This increased access to patient data facilitates pharmacists ability to detect prescription drug abuse and diversion.[13] In a study conducted by Fleming et al.,

pharmacists were prompted to use a PDMP in order to confirm suspicions of forgery related to CSPs.[13] Another study examined variations in pharmacy practice between users and non-users of PDMPs. This study suggested that PDMP users were less likely to discuss concerns of suspicion of drug diversion with the patient, but were as likely to contact the provider, refer the patient back to the provider, and refuse to fill the prescription.[14] The results from these two studies suggest that utilization of PDMP data to investigate CSPs when there is a question to their validity may increase a pharmacists level of confidence to take action and to exercise corresponding responsibility.[13]

The purpose of this study is to examine how integration and consistent use of a PDMP in pharmacy practice impacts pharmacists' dispensing practices related to CSPs. The study aims to determine if the use of INSPECT as a clinical resource in pharmacy practice: (1) promotes a change in practice to dispense fewer CSPs, (2) increases the likelihood of a pharmacist to report having refused to dispense a CSP, (3) and whether and to what extent more consistent use of INSPECT influences a pharmacist's total annual refusals of CSPs. As more and more evidence suggests that PDMPs are effective in reducing drug diversion and improving clinical decision-making, it is believed that pharmacists who report more consistent use of INSPECT in their pharmacy practice will be more likely to refuse dispensation of CSPs as a result of increased access to patient information that provides the data necessary to support their professional judgment.[10]

METHODS

Study Design

Survey & Data Collection

The study population included 10,606 providers who were identified by the IPLA as a pharmacist in the State of Indiana who held a valid license to dispense controlled substances in 2012. This cross-sectional study examined survey data collected from Indiana pharmacists through the *IPLA INSPECT Knowledge and Use Survey*.[12] The survey was developed through a collaborative effort between representatives from IPLA, the Indiana State Prescription Drug Abuse Prevention Task Force Education Committee, and the Indiana University Purdue University – Indianapolis (IUPUI) Center for Health Policy (CHP). The web-based survey was designed to gather information on pharmacists' practice characteristics and behaviors as well as key information about their knowledge and use of INSPECT. At the request of the CHP, IPLA sent an initial electronic invitation to all eligible practitioners as well as 3 follow-up reminders to complete the survey. The study was sanctioned by the Indiana Board of Pharmacy, and the study design and methods was reviewed and approved by Indiana University Institutional Review Board.

Of the 10,606 eligible pharmacists, a total of 1,582 completed the survey yielding an overall response rate of 15%. Due to the relatively low response rate for this survey, basic demographics of the study sample were compared to Indiana's 2012 Pharmacist Workforce Data to ensure the sample was representative of Indiana's total pharmacist population.[15] Table 3 illustrates the demographic characteristics for both the study sample and Indiana's pharmacist workforce in 2012. The table also includes other demographic and practice characteristics collected from the survey, which are relevant to this study. The sample exhibited similar

characteristics to Indiana's 2012 Pharmacist workforce in regards to age, years practicing, and gender.

Study Variables

The study contained 3 primary outcome measures, which include (1) dispensation change, (2) refused dispensations, (3) and annual refusals. Operational definitions for the outcome measures are included in Table 1. Contextually relevant demographic and practice characteristics were included in all analysis as covariates to control for factors that may influence the relationship between the primary outcome measure and the dependent variable.

One important practice characteristic that is commonly included in pharmacy research is degree type (PharmD, MPharm, BPharm). This measure is typically included to control for variations in education and training that may influence pharmacists' attitudes beliefs, practice characteristics as well as clinical knowledge. Degree type was not available in the data for this study. Instead, a new variable, training period, was generated to capture the important characteristics associated with variations in professional training. Training period is a 3 level categorical variable that indicates at what period in time the pharmacist went through training and was calculated based on the number of years in professional practice. Pharmacists practicing today were trained in one of three distinct cohorts, which are bound by events relating to the adoption of the Doctorate of Pharmacy as the sole entry degree for the profession. The parameters for training period are described in Table 2. Training period was incorporated as a covariate in all the statistical models for this study in order to control for variations in education and training.

Data Analyses

All statistical analyses were performed using SAS Statistical Software 9.4©. The 3 outcome variables were assessed with determination of odds ratio (OR) estimates and 95% Wald confidence intervals (CIs). Descriptive statistics (frequencies, means, and standard deviations) were performed when appropriate. Practice and demographic characteristics as well various independent response variables were analyzed using independent samples t tests or one-way analysis of variance (ANOVA).

Multiple Logistic Regression

In order to perform a binary logistic regression, the outcome measure dispensation change was dichotomized into, 'dispensed fewer' or 'dispensed more', CSPs. The primary independent variable of interest was whether or not respondents indicated that INSPECT was a factor leading to their dispensation change. Backward elimination was used to fit the model and to include all conceptually relevant independent variables in order to reduce possibility of a suppressor effect within the model.[16] These variables were removed one by one and the procedure determined the contribution of each variable at each step. All significant independent variables identified through this process were retained in the multiple regression analysis. The same process was followed for the other two (2) outcome measures. Refused dispensation, a binary variable, was analyzed in similar fashion using a binary logistic regression model to determine if reported use of INSPECT increased the likelihood of a pharmacist reporting at least one (1) refusal in the past 12 months.

The last outcome measure, annual refusals, was analyzed to determine to what degree various practice characteristics, such as the frequency of INSPECT use, influences a pharmacist's reported number of annual CSP refusals. The annual refusal data were categorized

into five (5) groups due to a non-normal distribution of the data which was revealed by execution of Kolmogorov-Smirnov test for normality (D=.24, P<.01). As a result, these data were analyzed using a multiple ordinal logistic regression model.

RESULTS

Demographics

The majority of respondents reported working in an outpatient setting (73.9%) compared to an inpatient setting as reported in Table 3. There were more male (54.4%) then female respondents. The mean age of respondents was 46.9 years of age. The average years practicing was 20.8 years with more than half the respondents having 20 or more years of experience. Nearly all respondents reported having heard of INSPECT (94.3%) prior to receiving the survey. However, only 71.8% of the respondents who had heard of INSPECT reported using it.

Change in Dispensation Practice of CSPs

A total of 506 (37.6%) respondents indicated that they had changed their dispensing practice related to CSPs in the last 12 months. Of those who reported changing their dispensing practices, significantly more respondents (74.7%) reported a change to dispense fewer CSPs (X^2 = 183.0, $p < .0001$) compared to those who reported a change to dispense more CSPs. Respondents were also asked to report on the factors that led to the dispensation change. The frequencies for the various factors leading to a dispensation change are provided in Table 4. The most frequently reported factors leading to a change in dispensing practice of CSPs were:

(1) New professional practice standards and protocols

(2) INSPECT providing greater access to patient prescription drug history

(3) Increased professional awareness of risks, benefits, and other solutions.

As illustrated by these data, in table 4, more than half (53%) of pharmacists reporting a change in their dispensing practice attribute the change to INSPECT increasing access to patient prescription drug history. Pharmacists were 6.4 times more likely to report a dispensation change to dispense fewer CSPs, if they also reported that increased access to patient prescription drug history through INSPECT was a factor leading to the change (OR = 6.4, 95% CI, 3.437 – 11.862).

Refused Dispensation of CSPs

Significant variations in pharmacists' decision to refuse to dispense a CSP existed within several practice and demographic characteristics including pharmacy setting, gender, training period, and use of INSPECT. These data are provided in Table 5. Outpatient pharmacists were 21 times more likely to have refused to dispense a CSP compared to inpatient pharmacists (OR = 20.9, 95% CI, 11.007 – 39.836). Practitioners who trained in Cohort 1 were 2.4 times more likely to refuse to dispense a CSP compared to pharmacists trained in Cohort 3 (OR = 2.4, 95% CI, 1.343 – 4.218). In other words, pharmacists trained after full implementation of the Accreditation Council for Pharmacy Education (ACPE) new accreditation and standards guidelines were more confident in refusing dispensing a CSP. Also, male pharmacists were 2.5 times more likely to have reported refusing dispensation of a CSP in the past 12 months compared to females (OR = 2.5, 95% CI, 1.454 – 4.204). Multiple logistic regression analysis indicated that pharmacists who reported using INSPECT were significantly more likely to have refused dispensation of a CSP compared to practitioners who did not use INSPECT (OR = 2.2, 95% CI, 1.339 – 3.693).

Annual Refusals of CSPs

Pharmacists may be more likely to refuse to dispense a CSP if using INSPECT, but the study aimed to further examine the relationship between consistent use of INSPECT and the magnitude of refusals reported by pharmacists. Table 6 provides the mean number of refusals based on key practice and demographic characteristics. Pharmacists who reported never using INSPECT only refused to dispense 6.9 CSPs on average per year. However, pharmacists who have completely integrated INSPECT into their professional practice and report always using the program, refused to dispense 24.8 CSPs on average per year. The multiple logistic regression model demonstrated that practitioners who reported using INSPECT "Periodically" or "At every visit" were statistically more likely to refuse to dispense more CSPs than pharmacists who reported never checking INSPECT ($OR_{periodically}$ = 3.0, 95% CI, 1.351 – 6.763; $OR_{everyvisit}$ = 3.3, 95% CI, 1.307 – 8.465).

DISCUSSION

Reducing prescription drug abuse in the United States is a multifaceted and intricate process that must be addressed from multiple perspectives. One of the major driving forces responsible for prescription drug abuse is the rise in opioid prescribing rates throughout the U.S. The number of opioid prescriptions dispensed by retail pharmacies has increased consistently since 1991.[17] General prescribing practices, high-volume prescribing, or even pill mills directly influence the increasing rates of opioid prescriptions being dispensed by retail pharmacies.[17] Regardless of the original source of these prescriptions, pharmacists share responsibility with the prescriber to ensure that these prescriptions are issued for a valid medical purpose.

DEA regulation 21 C.F.R. 1306.04 defines corresponding responsibility and understands that pharmacists play an integral role in preventing the diversion of controlled substances.[6]

Under this regulation, pharmacists are instructed to "exercise their professional judgment to determine whether a prescription for a controlled substance was issued for a legitimate reason".[5] Unfortunately, pharmacists frequently find themselves in precarious situations where they must determine if a controlled substance prescription was issued for a legitimate medical purpose by a practitioner acting in the usual course of professional practice. Many times pharmacists in these situations have few resources and have limited access to patient information needed to make sound clinical-decisions. Maxwell et al., suggested that the limited access to patient information fundamentally hampers pharmacists' abilities to make informed clinical-decisions.[18]

The Department of Health and Human Services (DHHS) identified 'clinical practice tools', such as PDMPs, as 1 of 8 primary domains necessary to preventing prescription drug abuse.[17] PDMPs may alleviate, to some degree, pharmacists' lack of access to patient information. One of the primary purposes of PDMPs is to increase access to patient prescription drug histories, which are critical to making informed clinical-decisions and exercising good professional judgment. According to the PDMP Center for Excellence, evidence continues to suggest that PDMPs are valuable tools for providers that ultimately may improve clinical decision-making and help reduce diversion of controlled substances.[10]

This study set out to explore the use of Indiana's prescription drug monitoring program as a support tool for improving clinical decision-making among pharmacists. It also examined the influence PDMPs have on CSP dispensing behaviors. The results from this study suggest that the use of INSPECT may lead to a reduction in CSP dispensing, which is illustrated by an increased likelihood of pharmacists to modify their dispensing practice to dispense fewer CSPs as a result of increased access to a patient's drug history. This also suggests that PDMPs may, in fact,

provide more information to pharmacists that may help to inform and support their professional judgment to exercise corresponding responsibility.

Not only did the use of INSPECT result in a reported reduction of dispensed controlled substances by pharmacists, but pharmacists were more likely to report refusing to dispense CSPs if they used INSPECT. In this regard, our data suggest that the use of INSPECT may facilitate pharmacists to exercise corresponding responsibility. We suspect that this is due to PDMPs providing greater access to patient information that serves as evidence to support their professional judgment to refuse to dispense a CSP in the event they are unable to resolve an identified red flag while processing a prescription.

Additionally, more consistent use of INSPECT was significantly more likely to result in a higher number of refusals to dispense controlled substances by a pharmacist. Practitioners who reported using INSPECT periodically or at every visit were significantly more likely to refuse to dispense a CSP as compared to pharmacists who reported never using INSPECT. This finding further exemplifies the notion that the integration and consistent use of INSPECT in pharmacy practice may provide pharmacists with the information necessary to be confident in their professional judgment and clinical decisions.

The findings from this study are consistent with findings from previous studies which concluded that PDMPs increase a pharmacist's level of confidence in their clinical decisions and professional judgment.[13, 14] This study adds a unique dimension to the growing body of literature surrounding prescription drug diversion and abuse, as the majority of current literature examines the overall effectiveness of PDMPs and the role of prescribers in reducing drug diversion and prescription drug abuse.[10] Less research is available regarding the impact PDMPs have on pharmacists' dispensing practice relating to CSPs. This study was one of the first known studies

to quantify pharmacists' professional judgment to refuse to dispense a CSP by examining the number of refusals reported by pharmacists.

Study Limitations

As PDMPs are now implemented in 49 states, there is a need for research that is capable of evaluating their effectiveness in reducing drug diversion throughout the country. Many states have started to evaluate these programs, but there are some limitations. The primary limitation to this study was response bias. Issues of drug diversion and prescribing or dispensing practices are considered to be controversial by many providers. Pharmacists may be hesitant to disclose information regarding dispensing practices due to fear of legal ramifications. It is likely that response bias may result in an overestimate of pharmacists reported number of refusals of CSPs. However, the *IPLA INSPECT Knowledge and Use Survey* was administered as an anonymous survey to help limit the potential response bias. Furthermore, the response rate for the survey was low and may be a limitation to the study. However, measures were taken to compare Indiana's pharmacist workforce to the study's sample in order to determine if the sample was similar to that of Indiana's pharmacist workforce. Lastly, the study was conducted within one state, Indiana. Therefore the generalizability of these findings to other states may be a limitation. In light of these limitations, the study findings should still be considered due to their implications and consistency with previous literature.

CONCLUSION

The Drug Enforcement Agency states that enforcement action against pharmacists is most likely to occur when pharmacists fail to exercise corresponding responsibility.[5] Unfortunately, the interpretation of what constitutes "exercising corresponding responsibility" is, to some degree, up for discussion. The DEA does indicate that pharmacists must identify and

resolve red flags prior to dispensing a controlled substance. Red flags arise as a result of pattern prescribing, fraudulent prescriptions, paying cash, or geographic anomalies, to name a few. Yet, lack of access to complete patient information as well as segmented relationships between pharmacists and physicians make resolution of red flags a time consuming and tedious task. These challenges may actually make exercising corresponding responsibility for pharmacists quite difficult. However, this study suggests that pharmacists who consistently use prescription drug monitoring programs in their pharmacy practice are over 3 times more likely to refuse controlled substance prescriptions as compared to those pharmacists who do not use a PDMP as a clinical practice tool. Implementing policies, strategies, and practices that support pharmacists in fulfilling their duty to "exercise his/her independent judgment when determining whether a prescription was issued for a legitimate medical purpose by a practitioner acting in the usual course of professional practice"[5], are vital to reducing diversion of prescription drugs. Future research should focus on understanding the barriers and challenges to successful integration of PDMPs in pharmacy practice.

Acknowledgements

This study was sanctioned by the Indiana Board of Pharmacy. The authors would like to acknowledge the collaborative effort between the Indiana Professional Licensing Agency, the Indiana State Prescription Drug Abuse Prevention Task Force Education Committee, and the Indiana University Purdue University – Indianapolis (IUPUI) Center for Health Policy (CHP) which led the development of the *IPLA Knowledge and Use Survey* used in this study. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Indiana Board of Pharmacy or the aforementioned collaborators.

Table 1
Operational definitions for study outcome measures

Outcome Measure	Operational Definition
Dispensation Change	*Dispensation change* is binary variable that identifies if a pharmacist reported a change in dispensing practice to dispense fewer or more controlled substances in the past 12 months. (dispense fewer=1, dispense more=0)
Refused Dispensation	*Refused dispensation* is a binary variable that indicates if a pharmacist reported refusing to dispense a controlled substance within the past 12 months. (Yes=1, No=0)
Annual Refusals	A pharmacist's total number of reported refusals to dispense a controlled substance within the past 12 months was an ordinal categorical variable with 5 categories. *Category 1:* < 1 refusals per year *Category 2:* 1-5 refusals per year *Category 3:* 6-10 refusals per year *Category 4:* 11-20 refusals per year *Category 5:* > 20 refusals per year

335

336

337

Table 2
Parameters used to determine training period cohorts

Training Period	*Description*
Cohort 1	Pharmacists trained after complete transition to the PharmD as the sole entry degree for the pharmacist profession and full implementation of ACPE's[1] new accreditation standards.
Cohort 2	Pharmacists trained during the transition to the Doctor of Pharmacy (PharmD) as the sole professional practice degree for pharmacy in the United States and after the adoption of ACPE's new accreditation standards in 1997.
Cohort 3	Pharmacists trained prior to the adoption of ACPE's[1] *Implementation Procedures for Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Education*. New accreditation standards and guidelines were adopted in June of 1997.

338 [1] Accreditation Council for Pharmacy Education

339

340

Table 3
Descriptive statistics for key demographic and practice characteristics of study sample

	IPLA INSPECT Survey Sample	2012 Indiana Pharmacist Workforce Data	
Demographic Characteristic	N (%)	N (%)	Statistic
Age (years)	Mean ± SD, 46.9 ± 13.7	Mean ± SD, 46.3 ± 12.4	P > .05
Years Practicing	Mean ± SD, 20.8 ± 14.0	Mean ± SD, 20.3 ± 12.9	P > .05
Gender			X^2 = .417, P > .05
Female	833 (54)	4963 (58)	
Male	699 (46)	3645 (42)	
Race/Ethnicity (n=1523)[a]			
White/non-Hispanic	1,408 (93)		
Asian American/ Pacific Islander	52 (3)		
Black/non-Hispanic	28 (2)		
American Indian/ Alaska Native	6 (0)		
Hispanic/Latino	15 (1)		
Training Period			
Cohort 1	412 (27)		
Cohort 2	483 (31)		
Cohort 3	630 (41)		
Pharmacy Setting			
Inpatient	353 (26)		
Outpatient	1,000 (74)		
Heard of INSPECT			
Yes	1,469 (94)		
No	88 (6)		
Used INSPECT			
Yes	1,043 (72)		
No	410 (28)		
Frequency of INSPECT			
At every visit	73 (8)		
Periodically	799 (78)		
Never	39 (4)		

341

342

Table 4
Frequency of factors which led to a change in dispensing practice of controlled substance prescriptions

What factors led you to change your dispensing practices? (N=497)	N (%)
New professional practice standards and protocols	276 (56)
INSPECT providing greater access to patient prescription drug history	263 (53)
Increased professional awareness of risks, benefits, and other solutions	249 (50)
Increased state or federal guidelines and recommendations	193 (39)
Change in my patient mix	121 (24)
I am afraid of legal ramifications	103 (21)
Increased law enforcement activity	65 (13)
Increased referrals from other physicians/providers for treatment of chronic pain patients	63 (13)
Increased patient awareness of risks and benefits	38 (8)
Increased referrals from other physicians/providers for treatment of acute (surgical/traumatic/short-term) pain patients	37 (7)
Other	72 (15)

343

344

345

Table 5
Pharmacists reported refusal to dispense a controlled substance prescription by key demographic and practice characteristics

Characteristic	Refused to Dispense	Did Not Refuse to Dispense	Total Responses	X^2	P-Value
	N (%)	**N (%)**			
Pharmacy Type			1,222	233.1	< .0001
Inpatient	217 (70)	94 (30)			
Outpatient	896 (98)	15 (2)			
Gender			1,305	12.6	0.0004
Female	639 (88)	85 (12)			
Male	546 (94)	35 (6)			
Training Period			1,337	13.0	0.0015
Cohort 1	330 (88)	46 (12)			
Cohort 2	386 (90)	45 (10)			
Cohort 3	500 (94)	30 (6)			
Have you ever used INSPECT?			1,254	57.2	< .0001
Yes	890 (95)	51 (5)			
No	252 (81)	61 (20)			

346

347

348

Table 6
Pharmacists reported annual refusals to dispense controlled substance prescriptions by key demographic and practice characteristics

Characteristic	Mean (SD)	Statistic	P Value
Pharmacy Type		-10.36	< .0001
Inpatient	2.6 (5.3)		
Outpatient	21.2 (25.6)		
Gender		-2.01	0.045
Female	15.7 (22.7)		
Male	18.6 (25.5)		
Training Period		3.21	0.041
Cohort 1	19.4 (26.2)		
Cohort 2	18.4 (25.2)		
Cohort 3	15.5 (22.3)		
Frequency of INSPECT Use		5.68	0.004
Never	6.9 (13.1)		
Periodically	18.6 (23.9)		
At Every Visit	24.8 (27.3)		

349

350
351

REFERENCES

1. Centers for Disease Control and Prevention. 2013 Drug Overdose Mortality Data Announced. *Prescription Opioid Deaths Level; Heroin-related Deaths Rise* 2015.

2. Centers for Disease Control Prevention. CDC grand rounds: prescription drug overdoses - a U.S. epidemic. *MMWR. Morbidity and mortality weekly report.* 2012;61:10-13.

3. Compton WM, Thomas YF, Conway KP, Colliver JD. Developments in the epidemiology of drug use and drug use disorders. *The American journal of psychiatry.* 2005;162:1494-1502.

4. Drug Enforcement Administration Office of Diversion Control. Pharmacist's manual: an informational outline of the Controlled Substances Act2010.

5. Cote L. A Pharmacist's Obligation: Corresponding Responsibility and Red Flags of Diversion. *DEA Chronicles*: Quarles & Brady LLP; 2013.

6. Prescriptions. In: Drug Enforcement Administration, ed. *21 C.F.R. § 1306*2014.

7. Bartels C. *Analysis of experienced pharmacist clinical decision-making fro drug therapy management in the ambulatory care setting*. University of Minnesota Digital Conservancy, University of Minnesota; 2013.

8. NAMSDL. The role of a prescription drug monitoring program in reducing prescription drug diversion, misuse, and abuse: National Alliance for Model State Drug Laws; 2014.

9. Blumenschein K, Fink J, Freeman PR, et al. Review of Prescription Drug Monitoring Programs in the United States: Institute for Pharmaceutical Outcomes and Policy; 2010:1-28.

10. PDMP Center of Excellence. Briefing on PDMP Effectiveness. Brandeis University: Bureau of Justice Assistance; 2014.

11. Indiana Professional Licensing Agency. What sort of Information is collected by INSPECT? . in.gov2014.

12. Kooreman H, Carnes N, Wright E. Key Findings and Recommendations from the 2013 IPLA INSPECT Knowledge and Use Survey. Center for Health Policy: Indiana University; 2014.

13. Fleming ML, Barner JC, Brown CM, Shepherd MD, Strassels SA, Novak S. Pharmacists' training, perceived roles, and actions associated with dispensing controlled substance prescriptions. *Journal of the American Pharmacists Association : JAPhA.* 2014;54:241-250.

14. Green TC, Mann MR, Bowman SE, et al. How does use of a prescription monitoring program change pharmacy practice? *Journal of the American Pharmacists Association : JAPhA.* 2013;53:273-281.

15. Maxey HL. Indiana Pharmacist 2012 Licensure Survey Data. In: Indiana University Health Workforce Studies, ed2015.

16. Menard S. *Applied Logistic Regression Analysis*. Thousand Oaks, CA: Sage; 2002.

17. Behavioral Health Coordinating Committee. Addressing Prescription Drug Abuse in the United States: Current Activities and Future Opportunities. Centers for Disease Control and Prevention2013.

18. Maxwell L, Odukoya OK, Stone JA, Chui MA. Using a conflict conceptual framework to describe challenges to coordinated patient care from the physicians' and pharmacists' perspective. *Research in social & administrative pharmacy : RSAP.* 2014;10:824-836.